The atmospheric conditions on the 5th were quite critical for a large portion of the Lake district, the oscillations of pressure being remarkably great. At Chicago a fall of about .20 inch occurred between 11 a. m. and 12 noon, and then again about .11 inch from 1:30 to 2:15 p. m. Severe squalls resulted in this vicinity and in the surrounding country. Several seiches occurred on southern Lake Michigan, the water rising and falling a number of times during the day. The lowest point reached at Chicago was 2.5 feet below normal and the highest 2.5 above, a fluctuation of 5 feet.

Except two warm periods, 3d to 5th, and 21st to 23d, the month was unusually cool throughout the district.

Heavy rainfalls occurred quite frequently during the month, the most marked periods being in the Missouri Valley, Kansas, and upper Mississippi Valley on the 1st; the upper Mississippi Valley and Lake region on the 3d; Illinois and the Ohio Valley on the 5th, and the Missouri and central Mississippi valleys on the 24th. The most pronounced heavy rains for a number of years began on the eastern Rocky Mountain slope on the 25th, and extended from that section eastward to the Atlantic coast during the 26th, 27th, and 28th. A number of stations in eastern Nebraska, northern Missouri and southwestern Iowa reported from 5 to 7.5 inches of rainfall in twenty-four hours.—*F. J. Walz, Inspector.*

DENVER FORECAST DISTRICT.

The month was not marked by unusual conditions.—*F. H. Brandenburg, District Forecaster.*

SAN FRANCISCO FORECAST DISTRICT.

On the 18th local storms occurred in southern California, and in places in San Bernardino County trees were uprooted by the wind. Some buildings were struck by lightning, but the damage was not great.—*A. G. McAdie, Professor of Meteorology.*

PORTLAND, OREG., FORECAST DISTRICT.

No storms or frost occurred and no warnings were issued.—*E. A. Beals, District Forecaster.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocity.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	4, a. m..	47	123	8, p. m..	41	72	3,025	4.5	672	28.0
II	8, a. m..	45	123	16, p. m..	46	60	4,725	8.5	556	23.2
III	16, p. m..	47	88	19, p. m..	46	60	1,925	3.0	642	26.8
IV	17, a. m..	53	122	21, p. m..	35	75	3,000	4.5	667	27.8
V	25, p. m..	53	108	29, p. m..	46	60	2,475	4.0	619	25.8
VI	27, a. m..	54	114	4, a. m.*	41	72	3,125	8.0	391	16.3
Sums							18,275	32.5	3,547	147.9
Mean of 6 paths							3,046		591	24.6
Mean of 32.5 days									562	23.4
Low areas.										
I	1, a. m..	37	120	8, a. m..	46	60	4,000	7.0	571	23.8
II	6, p. m..	39	108	8, p. m..	35	94	900	2.0	450	18.8
III	7, p. m..	50	97	10, p. m..	46	60	1,975	3.0	658	27.4
IV	8, p. m..	48	104	12, p. m..	48	68	2,225	4.0	556	23.2
V	17, a. m..	51	104	19, a. m..	48	68	1,625	2.0	812	33.8
VI	17, p. m..	37	120	22, p. m..	48	68	3,200	5.0	640	26.7
VII	24, p. m..	41	117	29, a. m..	37	75	2,900	4.5	644	26.9
Sums							16,825	27.5	4,331	180.6
Mean of 7 paths							2,403		619	25.8
Mean of 27.5 days									611	25.5

*September.

For graphic presentation of the movements of these highs and lows see Charts I and II.—*George E. Hunt, Chief Clerk, Forecast Division.*

RIVERS AND FLOODS.

Frequent and copious rains over the Missouri and upper Mississippi watersheds during the month prevented the usual seasonal decline in the rivers of those districts, and their mean stages were somewhat higher than during the preceding month, as well as considerably above the normal August stages.

The lower Mississippi fell almost steadily throughout the month, but no low water was experienced in any locality. The stages of the Ohio River and its tributaries were fairly satisfactory for all purposes except those of the upper Tennessee River, where low water necessitated a suspension of navigation for about one-half of the month.

On the 28th and 29th there were heavy rains over the upper Susquehanna watershed, and the river began to rise rapidly on the 29th. At Wilkesbarre, Pa., the river rose 14.6 feet from the 28th to the 30th, inclusive, with a maximum stage of 20 feet, or 3 feet above the danger line. Warnings of the coming rise were issued on the previous day, the water then standing at 7.3 feet.

Heavy rains fell over Texas during the last week of July, the amounts over the middle drainage basins of the Colorado and Brazos rivers ranging from 3 to 9 inches. The result was a marked rise in the rivers, necessitating the issue of flood warnings, beginning on July 29. The following report on these floods was prepared by Mr. L. H. Murdoch, Section Director, in charge of the United States Weather Bureau office at Galveston, Tex.:

Heavy rains began to fall over Texas on July 25, and by the 29th and 30th the middle drainage basins of the Colorado and Brazos rivers had received between 3 and 9 inches of precipitation. On the 29th the following warning was telegraphed to interested places on the Colorado River:

"Heavy floods will occur in streams emptying into the Colorado River near Austin, causing a marked rise in the Colorado River at Austin by Friday (in two days)."

On July 30 the following was telegraphed to interested localities along the Brazos River:

"Heavy floods will occur in streams emptying into the Brazos River between Waco and Hempstead, causing a decided rise in the Brazos River within the next few days."

The rise in the Colorado River at Austin was less than expected and unimportant, but a few miles below that place the river rose rapidly and left its banks. On the 30th a special observation telegraphed from Columbus showed a stage of 28.2 feet, or 4.2 feet above the danger line. The following warning was immediately telegraphed to towns below Columbus:

"Colorado River 4 feet above the danger line at Columbus. Crest of flood will reach Wharton by Sunday (in three days) and Bay City by Tuesday (in five days). Flood stages will continue several days."

The river continued to rise at Columbus until August 1, when a reading of 34.9 feet was recorded. Columbus is the lowest station on the Colorado River, and no record of levels below that point was received.

The rise in the Brazos River at Waco was only a few feet, but many of the streams flowing into it between Waco and Hempstead overflowed the adjacent bottoms. In a few localities the Brazos River itself left its banks, but not generally. The river rose quite rapidly at Hempstead, and the regular observation on August 3 gave a stage of 31.5 feet with rising water. On August 3 the following warning was telegraphed to points below Hempstead:

"Brazos River 32 feet at Hempstead and rising slowly. Flood stages of about 35 feet are now indicated for points below Hempstead. Crest of flood will reach Richmond and Booth about Thursday (August 6)."

The crest of the flood reached Booth on August 4, but practically the same level continued on the morning of the 5th. The highest stage recorded at Booth was 25.3 feet.

While not verified in some details, the warnings were timely and of great value to people having property interests in the river bottoms. The warnings issued for the Brazos River and the streams emptying therein were very favorably commented upon by the press.

A special case, in which the warnings proved of great value, is that of the Brazoria Irrigation Company, with headquarters in Galveston. One of the lifts of this company, located near Richmond, burned down a few days before the high water, and the brick wall next to the river collapsed. The coming flood would cause damage to the amount of several thousand dollars if the wall was not immediately repaired. When the flood warnings were issued the irrigation company chartered a special train, carrying mechanics and material to their plant. The workmen were able to keep the wall above the rising water and no damage resulted.

The highest and lowest water, mean stage, and monthly